

We claim:

1. A prosthetic walking system for attachment to an amputee, the prosthetic walking system comprising:

a pylon having an upper end for attachment to the amputee and a lower end;

a prosthetic foot;

an prosthetic ankle coupled between the pylon and the prosthetic foot, the prosthetic ankle having

an upper leg coupled to the lower end of the pylon;

a lower leg coupled to the prosthetic foot; and

an interconnecting portion located between the upper leg and the lower leg; and

at least one link coupled to at least one of the lower end of the pylon and the upper leg, the at least one link also coupled to at least one of the lower leg and the prosthetic foot, the at least one link at least partially defining a maximum displacement between the upper leg and the lower leg.

2. The prosthetic walking system of claim 1, wherein:

the upper leg has an anterior portion;

the lower leg has an anterior portion; and

the interconnecting portion is located between the anterior portion of the upper leg and the anterior portion of the lower leg.

3. The prosthetic walking system of claim 2, wherein:

the upper leg has a posterior portion;

the lower leg has a posterior portion; and

the at least one link is coupled between the posterior portion of the upper leg and the posterior portion of the lower leg.

4. The prosthetic walking system of claim 1, wherein the upper leg and the lower leg of the prosthetic ankle are substantially straight and the interconnecting portion of the prosthetic ankle is substantially arcuate.

5. The prosthetic walking system of claim 1, wherein the upper leg, the lower leg, and the interconnecting portion of the prosthetic ankle are each substantially arcuate.

6. The prosthetic walking system of claim 1, wherein the pylon and the prosthetic ankle are an integral unit.

7. The prosthetic walking system of claim 1, wherein the at least one link is a resilient belt having

5 an upper portion coupled to at least one of the pylon and the upper leg of the prosthetic ankle; and

a lower portion coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

8. The prosthetic walking system of claim 7, wherein the resilient belt is a cord extending at least twice between at least one of the pylon and the upper leg of the prosthetic ankle and at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

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9. The prosthetic walking system of claim 1, wherein the at least one link is a strap having

15 a top portion coupled between the pylon and the upper leg of the prosthetic ankle;

a bottom portion coupled between the prosthetic ankle and the prosthetic foot; and

20 an intermediate portion located between the top portion and the bottom portion, a length of the intermediate portion at least partially defining the maximum displacement between the upper leg and the lower leg.

10. The prosthetic walking system of claim 1, wherein the at least one link includes

25 a first link having a first portion and a second portion, the first portion of the first link being coupled to at least one of the pylon and the upper leg of the prosthetic ankle;

a second link having a first portion and a second portion, the first portion of the second link being coupled to the second portion of the first link; and

a heel having a top portion and a bottom portion, the top portion of the heel being coupled to the second portion of the second link, the bottom portion of the heel being coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

11. The prosthetic walking system of claim 10, further comprising an adjustment screw coupled to at least one of the first link and the second link and to the heel, wherein the adjustment screw is adjustable to vary the maximum displacement between the upper leg and the lower leg of the prosthetic ankle.

5 12. The prosthetic walking system of claim 1, wherein the at least one link includes at least one of a hydraulic cylinder and a pneumatic cylinder coupled to at least one of the pylon and the upper leg of the prosthetic ankle and to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

10 13. The prosthetic walking system of claim 1, wherein the upper leg of the prosthetic ankle has a first length and the lower leg of the prosthetic ankle has a second length greater than the first length.

14. The prosthetic walking system of claim 1, wherein at least a portion of the prosthetic ankle is flexible.

15 15. The prosthetic walking system of claim 14, wherein the interconnecting portion is flexible.

16. The prosthetic walking system of claim 1, wherein at least a portion of the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

17. The prosthetic walking system of claim 1, wherein:

20 the prosthetic ankle has a cross-sectional shape having a first moment of inertia and the pylon has a cross-sectional shape having a second moment of inertia; and

the first moment of inertia is less than the second moment of inertia so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

25 18. The prosthetic walking system of claim 1, wherein the pylon has a first width and a portion of the prosthetic ankle has a second width smaller than the first width so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

19. The prosthetic walking system of claim 18, wherein the portion of the prosthetic ankle having the second width is positioned asymmetrically with respect to a longitudinal axis of the pylon.

5 20. The prosthetic walking system of claim 1, wherein the pylon has a substantially circular cross-sectional shape and the prosthetic ankle has a substantially rectangular cross-sectional shape.

10 21. The prosthetic walking system of claim 1, wherein:
the pylon is constructed of a first material;
the prosthetic ankle is constructed of a different second material; and
the second material is more compliant than the first material so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

15 22. The prosthetic walking system of claim 21, wherein the first material is carbon-fiber composite and the second material is fiberglass.

23. The prosthetic walking system of claim 1, wherein at least one of the pylon, the prosthetic ankle, and the prosthetic foot includes a lateral section independently movable with respect to a medial section.

24. The prosthetic walking system of claim 23, wherein the prosthetic foot includes a toe portion and the toe portion includes the lateral section and the medial section.

20 25. The prosthetic walking system of claim 24, wherein:
the lateral section has a first width; and
the medial section has a second width smaller than the first width.

26. A method of adjusting a prosthetic walking system according to an amputee's gait, the method comprising:

attaching a prosthetic walking system to the amputee, the prosthetic walking system including a pylon, a prosthetic foot, and a prosthetic ankle coupled between the pylon and the prosthetic foot, the prosthetic ankle having an upper leg, a lower leg, and an interconnecting portion located between the upper leg and the lower leg;

5 providing at least one link coupled between at least one of the pylon and the upper leg and at least one of the lower leg and the prosthetic foot;

limiting the maximum displacement between the upper leg and the lower leg
10 with the at least one link; and

adjusting the at least one link to change the maximum displacement between the upper leg and the lower leg.

27. The method of claim 26, further comprising rotating an adjustment screw to adjust the at least one link.

28. The method of claim 26, further comprising changing a pressure in at least one of a hydraulic cylinder and a pneumatic cylinder to adjust the at least one link.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 279 280 281 282 283 284 285 286 287 288 289 289 290 291 292 293 294 295 296 297 298 299 299 300 301 302 303 304 305 306 307 308 309 309 310 311 312 313 314 315 316 317 318 319 319 320 321 322 323 324 325 326 327 328 329 329 330 331 332 333 334 335 336 337 338 339 339 340 341 342 343 344 345 346 347 348 349 349 350 351 352 353 354 355 356 357 358 359 359 360 361 362 363 364 365 366 367 368 369 369 370 371 372 373 374 375 376 377 378 379 379 380 381 382 383 384 385 386 387 388 389 389 390 391 392 393 394 395 396 397 398 399 399 400 401 402 403 404 405 406 407 408 409 409 410 411 412 413 414 415 416 417 418 419 419 420 421 422 423 424 425 426 427 428 429 429 430 431 432 433 434 435 436 437 438 439 439 440 441 442 443 444 445 446 447 448 449 449 450 451 452 453 454 455 456 457 458 459 459 460 461 462 463 464 465 466 467 468 469 469 470 471 472 473 474 475 476 477 478 479 479 480 481 482 483 484 485 486 487 488 489 489 490 491 492 493 494 495 496 497 497 498 499 499 500 501 502 503 504 505 506 507 508 509 509 510 511 512 513 514 515 516 517 518 519 519 520 521 522 523 524 525 526 527 528 529 529 530 531 532 533 534 535 536 537 538 539 539 540 541 542 543 544 545 546 547 548 549 549 550 551 552 553 554 555 556 557 558 559 559 560 561 562 563 564 565 566 567 568 569 569 570 571 572 573 574 575 576 577 578 579 579 580 581 582 583 584 585 586 587 588 589 589 590 591 592 593 594 595 596 597 597 598 599 599 600 601 602 603 604 605 606 607 608 609 609 610 611 612 613 614 615 616 617 618 619 619 620 621 622 623 624 625 626 627 628 629 629 630 631 632 633 634 635 636 637 638 639 639 640 641 642 643 644 645 646 647 648 649 649 650 651 652 653 654 655 656 657 658 659 659 660 661 662 663 664 665 666 667 668 669 669 670 671 672 673 674 675 676 677 678 679 679 680 681 682 683 684 685 686 687 688 689 689 690 691 692 693 694 695 696 697 697 698 699 699 700 701 702 703 704 705 706 707 708 709 709 710 711 712 713 714 715 716 717 718 719 719 720 721 722 723 724 725 726 727 728 729 729 730 731 732 733 734 735 736 737 738 739 739 740 741 742 743 744 745 746 747 748 749 749 750 751 752 753 754 755 756 757 758 759 759 760 761 762 763 764 765 766 767 768 769 769 770 771 772 773 774 775 776 777 778 779 779 780 781 782 783 784 785 786 787 788 789 789 790 791 792 793 794 795 796 797 797 798 799 799 800 801 802 803 804 805 806 807 808 809 809 810 811 812 813 814 815 816 817 818 819 819 820 821 822 823 824 825 826 827 828 829 829 830 831 832 833 834 835 836 837 838 839 839 840 841 842 843 844 845 846 847 848 849 849 850 851 852 853 854 855 856 857 858 859 859 860 861 862 863 864 865 866 867 868 869 869 870 871 872 873 874 875 876 877 878 879 879 880 881 882 883 884 885 886 887 888 889 889 890 891 892 893 894 895 896 897 897 898 899 899 900 901 902 903 904 905 906 907 908 909 909 910 911 912 913 914 915 916 917 918 919 919 920 921 922 923 924 925 926 927 928 929 929 930 931 932 933 934 935 936 937 938 939 939 940 941 942 943 944 945 946 947 948 949 949 950 951 952 953 954 955 956 957 958 959 959 960 961 962 963 964 965 966 967 968 969 969 970 971 972 973 974 975 976 977 978 979 979 980 981 982 983 984 985 986 987 988 989 989 990 991 992 993 994 995 996 997 997 998 999 999 1000

29. A prosthetic walking system for attachment to an amputee, the prosthetic walking system comprising:

a pylon having an upper end for attachment to the amputee and a lower end; a prosthetic foot having a heel portion;

an prosthetic ankle coupled between the pylon and the prosthetic foot, the prosthetic ankle having

an upper leg coupled to the lower end of the pylon, the upper leg having an anterior portion;

a lower leg coupled to the heel portion, the lower leg having an anterior portion; and

an interconnecting portion located between the anterior portion of the upper leg and the anterior portion of the lower leg; and

a link assembly at least partially defining a maximum displacement between the upper leg and the lower leg, the link assembly including

a first link having a first portion and a second portion, the first portion of the first link coupled to the pylon;

a second link having a first portion and a second portion, the first portion of the second link coupled to the second portion of the first link; and

a heel having a first portion and a second portion, the first portion of the heel coupled to the second portion of the second link, the second portion of the heel coupled to the heel portion of the prosthetic foot.

30. The prosthetic walking system of claim 29, wherein:

the second portion of the first link is rotatably coupled to the first portion of the second link;

the second portion of the second link is rotatably coupled to the first portion of the heel; and

the first link and the second link are pivotably responsive to flexure of the prosthetic ankle.

31. The prosthetic walking system of claim 29, wherein the upper leg, the lower leg, and the interconnecting portion of the prosthetic ankle are each substantially arcuate.

32. The prosthetic walking system of claim 29, wherein the upper leg of the prosthetic ankle has a first length and the lower leg of the prosthetic ankle has a second length greater than the first length.

33. The prosthetic walking system of claim 29, wherein at least a portion of the 5 prosthetic ankle is flexible.

34. The prosthetic walking system of claim 33, wherein the interconnecting portion is flexible.

35. The prosthetic walking system of claim 29, wherein at least a portion of the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic 10 walking system.

36. The prosthetic walking system of claim 29, wherein:
the prosthetic ankle has a cross-sectional shape having a first moment of inertia and the pylon has a cross-sectional shape having a second moment of inertia; and
the first moment of inertia is less than the second moment of inertia so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

37. The prosthetic walking system of claim 29, wherein the pylon has a first width and a portion of the prosthetic ankle has a second width smaller than the first width so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic 20 walking system.

38. The prosthetic walking system of claim 29, wherein the pylon has a substantially circular cross-sectional shape and the prosthetic ankle has a substantially rectangular cross-sectional shape.

39. The prosthetic walking system of claim 29, wherein:
25 the pylon is constructed of a first material;
the prosthetic ankle is constructed of a different second material; and
the second material is more compliant than the first material so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

40. The prosthetic walking system of claim 39, wherein the first material is carbon-fiber composite and the second material is fiberglass.

41. A prosthetic walking system for attachment to an amputee, the prosthetic walking system comprising:

a pylon having an upper end for attachment to the amputee and a lower end; a prosthetic ankle integral with the pylon, the prosthetic ankle including

5 an upper leg having an anterior portion and a posterior portion, the posterior portion being integral with the lower end of the pylon;

a lower leg having an anterior portion and a posterior portion;

and

10 an interconnecting portion located between the anterior portion of the upper leg and the anterior portion of the lower leg; and

a prosthetic foot coupled to at least one of the anterior portion and the posterior portion of the lower leg of the prosthetic ankle.

42. The prosthetic walking system of claim 41, wherein the upper leg and the lower leg of the prosthetic ankle are substantially straight and the interconnecting portion of the prosthetic ankle is substantially arcuate.

43. The prosthetic walking system of claim 41, wherein the upper leg, the lower leg, and the interconnecting portion of the prosthetic ankle are each substantially arcuate.

44. The prosthetic walking system of claim 41, further comprising at least one link coupled between at least one of the lower end of the pylon and the upper leg and at least one of the lower leg and the prosthetic foot, the at least one link at least partially defining a maximum displacement between the upper leg and the lower leg.

45. The prosthetic walking system of claim 44, wherein the at least one link is a resilient belt having

25 an upper portion coupled to at least one of the pylon and the upper leg of the prosthetic ankle; and

a lower portion coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

46. The prosthetic walking system of claim 45, wherein the resilient belt is a cord extending at least twice between at least one of the pylon and the upper leg of the prosthetic ankle and at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

47. The prosthetic walking system of claim 44, wherein the at least one link is a strap having a top portion coupled between the pylon and the upper leg of the prosthetic ankle; a bottom portion coupled between the prosthetic ankle and the prosthetic foot; and an intermediate portion located between the top portion and the bottom portion, a length of the intermediate portion at least partially defining the maximum displacement between the upper leg and the lower leg.

10 48. The prosthetic walking system of claim 44, wherein the at least one link includes a first link having a first portion and a second portion, the first portion of the first link being coupled to at least one of the pylon and the upper leg of the prosthetic ankle; a second link having a first portion and a second portion, the first portion of the second link being coupled to the second portion of the first link; and a heel having a top portion and a bottom portion, the top portion of the heel being coupled to the second portion of the second link, the bottom portion of the heel being coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

20 49. The prosthetic walking system of claim 48, further comprising an adjustment screw coupled between at least one of the first link and the second link and the heel, wherein the adjustment screw is adjustable in order to vary the maximum displacement between the upper leg and the lower leg of the prosthetic ankle.

25 50. The prosthetic walking system of claim 44, wherein the at least one link includes at least one of a hydraulic cylinder and a pneumatic cylinder coupled to at least one of the pylon and the upper leg of the prosthetic ankle and to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

51. The prosthetic walking system of claim 41, wherein the upper leg of the prosthetic ankle has a first length and the lower leg of the prosthetic ankle has a second length greater than the first length.

30 52. The prosthetic walking system of claim 41, wherein at least a portion of the prosthetic ankle is flexible.

53. The prosthetic walking system of claim 52, wherein the interconnecting portion is flexible.

54. The prosthetic walking system of claim 41, wherein at least a portion of the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

55. The prosthetic walking system of claim 41, wherein:
the prosthetic ankle has a cross-sectional shape having a first moment of inertia and the pylon has a cross-sectional shape having a second moment of inertia; and
the first moment of inertia is less than the second moment of inertia so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

56. The prosthetic walking system of claim 41, wherein the pylon has a first width and a portion of the prosthetic ankle has a second width smaller than the first width so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

57. The prosthetic walking system of claim 56, wherein the portion of the prosthetic ankle having the second width is positioned asymmetrically with respect to a longitudinal axis of the pylon.

58. The prosthetic walking system of claim 41, wherein the pylon has a substantially circular cross-sectional shape and the prosthetic ankle has a substantially rectangular cross-sectional shape.

59. The prosthetic walking system of claim 41, wherein:
the pylon is constructed of a first material;
the prosthetic ankle is constructed of a different second material; and
the second material is more compliant than the first material so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

60. The prosthetic walking system of claim 59, wherein the first material is carbon-fiber composite and the second material is fiberglass.

61. The prosthetic walking system of claim 41, wherein at least one of the pylon, the prosthetic ankle, and the prosthetic foot includes a lateral section independently movable with respect to a medial section.

62. The prosthetic walking system of claim 61, wherein the prosthetic foot
5 includes a toe portion and the toe portion includes the lateral section and the medial section.

63. The prosthetic walking system of claim 62, wherein:
the lateral section has a first width; and
the medial section has a second width smaller than the first width.

4. A prosthetic walking system for attachment to an amputee, the prosthetic walking system comprising:

a pylon having an upper end for attachment to the amputee and a lower end;
a prosthetic foot; and

5 an prosthetic ankle coupled between the pylon and the prosthetic foot, the prosthetic ankle having

10 an upper leg coupled to the lower end of the pylon;
a lower leg coupled to the prosthetic foot;
an interconnecting portion located between the upper leg and

15 the lower leg; and
a weakened portion defined within at least one of the upper leg and the interconnecting portion, the weakened portion being less resistant to bending than the pylon so that the prosthetic walking system flexes at the weakened portion when a load is placed on the prosthetic walking system by the amputee.

20 65. The prosthetic walking system of claim 64, wherein the pylon has a first width and the weakened portion has a second width smaller than the first width.

66. The prosthetic walking system of claim 65, wherein the weakened portion having the second width is positioned asymmetrically with respect to a longitudinal axis of the pylon.

67. The prosthetic walking system of claim 64, wherein the pylon has a first cross-sectional area and the weakened portion has a second cross-sectional area smaller than the first cross-sectional area.

68. The prosthetic walking system of claim 64, wherein:

25 the weakened portion has a cross-sectional shape having a first moment of inertia and the pylon has a cross-sectional shape having a second moment of inertia; and

the first moment of inertia is less than the second moment of inertia so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

69. The prosthetic walking system of claim 64, wherein the pylon has a substantially circular cross-sectional shape and the prosthetic ankle has a substantially rectangular cross-sectional shape.

70. The prosthetic walking system of claim 64, wherein:
5 the pylon is constructed of a first material;
the weakened portion is constructed of a different second material; and
the second material is more compliant than the first material so that the weakened portion flexes before the pylon flexes when a load is placed on the prosthetic walking system.

10 71. The prosthetic walking system of claim 70, wherein the first material is carbon-fiber composite and the second material is fiberglass.

72. The prosthetic walking system of claim 64, wherein the upper leg and the lower leg of the prosthetic ankle are substantially straight and the interconnecting portion of the prosthetic ankle is substantially arcuate.

15 73. The prosthetic walking system of claim 64, wherein the upper leg, the lower leg, and the interconnecting portion of the prosthetic ankle are each substantially arcuate.

74. The prosthetic walking system of claim 64, further comprising at least one link coupled between at least one of the lower end of the pylon and the upper leg and at least one of the lower leg and the prosthetic foot, the at least one link at least partially defining a
20 maximum displacement between the upper leg and the lower leg.

75. The prosthetic walking system of claim 74, wherein the at least one link is a resilient belt having

an upper portion coupled to at least one of the pylon and the upper leg of the prosthetic ankle; and

25 a lower portion coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

76. The prosthetic walking system of claim 75, wherein the resilient belt is a cord extending at least twice between at least one of the pylon and the upper leg of the prosthetic ankle and at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

77. The prosthetic walking system of claim 74, wherein the at least one link is a strap having a top portion coupled between the pylon and the upper leg of the prosthetic ankle; and a bottom portion coupled between the prosthetic ankle and the prosthetic foot; and an intermediate portion coupled between the top portion and the bottom portion, a length of the intermediate portion defining the maximum displacement between the upper leg and the lower leg.

78. The prosthetic walking system of claim 74, wherein the at least one link includes a first link having a first portion and a second portion, the first portion of the first link being coupled to at least one of the pylon and the upper leg of the prosthetic ankle; a second link having a first portion and a second portion, the first portion of the second link being coupled to the second portion of the first link; and a heel having a top portion and a bottom portion, the top portion of the heel being coupled to the second portion of the second link, the bottom portion of the heel being coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

79. The prosthetic walking system of claim 78, further comprising an adjustment screw coupled to at least one of the first link and the second link and to the heel, wherein the adjustment screw is adjustable to vary the maximum displacement between the upper leg and the lower leg of the prosthetic ankle.

80. The prosthetic walking system of claim 74, wherein the at least one link includes at least one of a hydraulic cylinder and a pneumatic cylinder coupled to at least one of the pylon and the upper leg of the prosthetic ankle and to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

81. The prosthetic walking system of claim 64, wherein the upper leg of the prosthetic ankle has a first length and the lower leg of the prosthetic ankle has a second length greater than the first length.

82. The prosthetic walking system of claim 64, wherein at least a portion of the prosthetic ankle is flexible.

83. The prosthetic walking system of claim 82, wherein the interconnecting portion is flexible.

84. The prosthetic walking system of claim 64, wherein at least a portion of the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

85. The prosthetic walking system of claim 64, wherein at least one of the pylon, the prosthetic ankle, and the prosthetic foot includes a lateral section independently movable with respect to a medial section.

86. The prosthetic walking system of claim 85, wherein the prosthetic foot includes a toe portion and the toe portion includes the lateral section and the medial section.

87. The prosthetic walking system of claim 86, wherein:
the lateral section has a first width; and
the medial section has a second width smaller than the first width.

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45 88. A prosthetic walking system for attachment to an amputee, the prosthetic walking system comprising:

5 a pylon having an upper end for attachment to the amputee and a lower end;

10 a prosthetic foot; and

15 a prosthetic ankle coupled between the pylon and the prosthetic foot, the prosthetic ankle having

20 an upper leg coupled to the lower end of the pylon by a first connection;

25 a lower leg coupled to the prosthetic foot by a second connection; and

30 an interconnecting portion located between the upper leg and the lower leg;

35 at least one of (a) the first connection being adjustable so that the lower end of the pylon can be coupled to the upper leg in at least two positions; and (b) the second connection being adjustable so that the prosthetic foot can be coupled to the lower leg in at least two positions.

40 89. The prosthetic walking system of claim 88, wherein:

45 the upper leg has an aperture adapted to receive the lower end of the pylon;

50 and

55 the aperture has a first portion adapted to receive the pylon in a first position and a second portion adapted to receive the pylon in a second position.

60 90. The prosthetic walking system of claim 88, wherein the pylon has a substantially circular cross-sectional area and the prosthetic ankle has a substantially 65 rectangular cross-sectional area.

70 91. The prosthetic walking system of claim 88, wherein at least a portion of the prosthetic ankle is flexible.

75 92. The prosthetic walking system of claim 91, wherein the interconnecting portion is flexible.

93. The prosthetic walking system of claim 88, wherein at least a portion of the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

5 94. The prosthetic walking system of claim 88, wherein the pylon has a first width and a portion of the prosthetic ankle has a second width smaller than the first width so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

10 95. The prosthetic walking system of claim 94, wherein the portion of the prosthetic ankle having the second width is positioned asymmetrically with respect to a longitudinal axis of the pylon.

96. The prosthetic walking system of claim 88, wherein:
the prosthetic ankle has a cross-sectional shape having a first moment of inertia and the pylon has a cross-sectional shape having a second moment of inertia; and
the first moment of inertia is less than the second moment of inertia so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

97. The prosthetic walking system of claim 88, wherein:
the pylon is constructed of a first material;
the prosthetic ankle is constructed of a different second material; and
the second material is more compliant than the first material so that the prosthetic ankle flexes before the pylon flexes when a load is placed on the prosthetic walking system.

98. The prosthetic walking system of claim 97, wherein the first material is carbon-fiber composite and the second material is fiberglass.

25 99. The prosthetic walking system of claim 88, wherein the upper leg and the lower leg of the prosthetic ankle are substantially straight and the interconnecting portion of the prosthetic ankle is substantially arcuate.

100. The prosthetic walking system of claim 88, wherein the upper leg, the lower leg, and the interconnecting portion of the prosthetic ankle are each substantially arcuate.

101. The prosthetic walking system of claim 88, further comprising at least one link coupled between at least one of the lower end of the pylon and the upper leg and at least one of the lower leg and the prosthetic foot, the at least one link at least partially defining a maximum displacement between the upper leg and the lower leg.

5 102. The prosthetic walking system of claim 101, wherein the at least one link is a resilient belt having

an upper portion coupled to at least one of the pylon and the upper leg of the prosthetic ankle; and

10 a lower portion coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

103. The prosthetic walking system of claim 102, wherein the resilient belt is a cord extending at least twice between at least one of the pylon and the upper leg of the prosthetic ankle and at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

104. The prosthetic walking system of claim 101, wherein the at least one link is a strap having

a top portion coupled between the pylon and the upper leg of the prosthetic ankle;

a bottom portion coupled between the prosthetic ankle and the prosthetic foot; and

20 an intermediate portion coupled between the top portion and the bottom portion, a length of the intermediate portion defining the maximum displacement between the upper leg and the lower leg.

105. The prosthetic walking system of claim 101, wherein the at least one link includes

25 a first link having a first portion and a second portion, the first portion of the first link being coupled to at least one of the pylon and the upper leg of the prosthetic ankle;

a second link having a first portion and a second portion, the first portion of the second link being coupled to the second portion of the first link; and

30 a heel having a top portion and a bottom portion, the top portion of the heel being coupled to the second portion of the second link, the bottom portion of the heel being coupled to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

106. The prosthetic walking system of claim 105, further comprising an adjustment screw coupled to at least one of the first link and the second link and to the heel, wherein the adjustment screw is adjustable to vary the maximum displacement between the upper leg and the lower leg of the prosthetic ankle.

5 107. The prosthetic walking system of claim 101, wherein the at least one link includes at least one of a hydraulic cylinder and a pneumatic cylinder coupled to at least one of the pylon and the upper leg of the prosthetic ankle and to at least one of the lower leg of the prosthetic ankle and the prosthetic foot.

10 108. The prosthetic walking system of claim 88, wherein the upper leg of the prosthetic ankle has a first length and the lower leg of the prosthetic ankle has a second length greater than the first length.

11 109. The prosthetic walking system of claim 88, wherein at least one of the pylon, the prosthetic ankle, and the prosthetic foot includes a lateral section independently movable with respect to a medial section.

12 110. The prosthetic walking system of claim 109, wherein the prosthetic foot includes a toe portion and the toe portion includes the lateral section and the medial section.

13 111. The prosthetic walking system of claim 110, wherein:
the lateral section has a first width; and
the medial section has a second width smaller than the first width.